EXHIBIT 21

CONFIDENTIAL

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF PUERTO RICO

In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of THE COMMONWEALTH OF PUERTO RICO, et al. Debtors.	PROMESA TITLE III Case No. 17-BK-3283-LTS (Jointly Administered)
In re: THE FINANCIAL OVERSIGHT AND MANAGEMENT BOARD FOR PUERTO RICO, as representative of THE PUERTO RICO ELECTRIC POWER AUTHORITY, Debtor.	Case No. 17-BK-4780-LTS **This Court Filing Relates Only to PREPA and Shall be Filed Only in Case No. 17-BK-4780-LTS and Main Docket 17-BK-3283-LTS**

EXPERT REBUTTAL REPORT OF MAUREEN M. CHAKRABORTY, PHD

MAY 15, 2023

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I. INTRODUCTION

1. I, Maureen M. Chakraborty, submitted an expert report in the above-captioned matter on April 28, 2023 (the "Chakraborty Confirmation Report").[1] In that report, I discussed the Board's methodology for calculating the Revenue Envelope and Legacy Charge. I also presented an analysis of a reasonable range of Additional Net Revenues that PREPA is capable of collecting from customers to repay its creditors. This analysis incorporated the considerations identified by the Board, including that PREPA's rates must, at all times, be affordable to its customers, enable PREPA's long-term sustainability, and account for the impact that an additional increase in the price of electricity could have on the demand for electricity.[2] To perform my calculations, I used the same general methodology used by the Board but corrected certain unsupportable assumptions. The effect of these corrections was to increase the Revenue Envelope and the Additional Net Revenues that PREPA is capable of collecting through 2058. Based on my analysis, I concluded that PREPA is capable of collecting a net present value ("NPV") of $13.39 billion of Additional Net Revenues through 2058.[3]

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1 *See* Expert Report of Maureen M. Chakraborty, PhD, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, April 28, 2023 ("Chakraborty Confirmation Report").

2 Disclosure Statement for Modified Second Amended Title III Plan of Adjustment of the Puerto Rico Electric Power Authority, Exhibit P: Legacy Charge Derivation, *In re: The Financial Oversight and Management Board for Puerto Rico, as representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, dated March 1, 2023 (hereafter "Legacy Charge Derivation"), p. 2.

3 *See* Chakraborty Confirmation Report, ¶ 23 and Figure 1.

A. Assignment

2. Counsel for the Ad Hoc Group of PREPA Bondholders, Assured Guaranty Corp., Assured Guaranty Municipal Corp., and Syncora Guarantee Inc. (the "Bondholders") has asked me to review and respond to certain opinions set forth in the Expert Report of Glenn R. George, MBA, PE, PhD, which was submitted on behalf of the Financial Oversight and Management Board for Puerto Rico (the "Board") on April 28, 2023 (the "George Confirmation Report").[4] At Counsel's request, I have also reviewed the expert disclosure and deposition testimony of William P. Zarakas, of the Brattle Group, Inc. (the "Brattle Group"), concerning the Revenue Envelope and Legacy Charge Model that he and his team at the Brattle Group prepared at the Board's direction.[5]

B. Qualifications, Compensation, and Information Considered

3. My qualifications, including a list of all publications that I have authored and expert testimony that I have provided in the last four years, are as described in the Chakraborty Confirmation Report.[6]

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4 *See* Expert Report of Glenn R. George, MBA, PE, PhD, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, April 28, 2023 ("George Confirmation Report").

5 *See* Debtor's Opening Expert Report and Disclosures, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors,* PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, April 28, 2023, ¶ 2(f); Transcript of Deposition of William Zarakas, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors,* PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 4, 2023 ("Zarakas Transcript").

6 *See* Chakraborty Confirmation Report, Section I.B, Appendix A, and Appendix B.

4. Analysis Group, Inc. ("Analysis Group") bills on an hourly basis for my work in connection with this matter. My billing rate for time spent on this matter is $1,055 per hour. Employees of Analysis Group, working under my direction and supervision, have assisted me in this assignment at their standard hourly rates. Neither my compensation nor Analysis Group's is contingent upon the opinions I form or the outcome of this case.

5. In preparing this report, I, along with Analysis Group staff working under my direction, reviewed various documents and data sources. **Appendix A** to this report lists documents and data sources that I considered.

C. Dr. George's Assignment and Opinions

6. Counsel for the Board asked Dr. George to:

> … provide [his] expert opinion on the methodology applied by the Brattle Group, Inc. …, at the direction of the Oversight Board, in determining the Legacy Charge in the Plan of Adjustment. More specifically, [he has] been asked to opine on (i) whether the Legacy Charge provides PREPA's creditors with reasonable recoveries on their claims given PREPA's need to continue operations, as well as the burden on ratepayers and the Puerto Rico economy of increased rates; (ii) whether the methodology used by Brattle to determine the Legacy Charge is appropriate; and (iii) whether the design of the Legacy Charge is consistent with principles of just and reasonable rates.[7]

7. Dr. George's primary opinions include that (i) he did not identify any "material calculation errors" or "divergences from practices generally applied in the field of utility ratemaking" in the course of reviewing the Revenue Envelope and Legacy Charge Model; (ii) the approach reflected in this model was "appropriate in reaching a rate that ensures PREPA's continuing operations and attempts to limit its loss of customers and future revenue needed to

7 George Confirmation Report, ¶ 8.

service debt," and (iii) the revenue generated from the Board's estimated Legacy Charge "represents the upper bound of cash which can reasonably be made available for debt repayment…."[8]

II. SUMMARY OF OPINIONS

8. My opinions in this report are summarized as follows.

9. First, I conclude that Dr. George overlooked material errors in the Board's Revenue Envelope and Legacy Charge Model that I identified in the Chakraborty Confirmation Report. The correction of each of these errors individually serves to increase Additional Net Revenues available for servicing the New Bonds by hundreds of millions, and even billions, of dollars, relative to the Board's estimate of $5.68 billion.

10. Second, I further disagree with Dr. George's view that the proposed Legacy Charge represents an upper bound of affordability. Dr. George's comparison of household expenditures on electricity in Puerto Rico with household expenditures on electricity in the South Atlantic region in the United States does not take into account the significantly lower shelter costs in Puerto Rico compared to the South Atlantic region in the United States. In addition, Dr. George's suggestion that a large portion of households in Puerto Rico would spend more than six percent of their incomes on electricity is misleading, as the vast majority of consumers below the median income level would be exempt from the Legacy Charge altogether. Indeed, due to their higher income levels, most of PREPA's residential customers who would pay the Legacy Charge would have a materially lower electricity share of wallet than the Board's six percent threshold.

8 George Confirmation Report, ¶¶ 13-14.

III. DR. GEORGE OVERLOOKS MATERIAL ERRORS IN THE BOARD'S ESTIMATION OF ADDITIONAL NET REVENUES

11. In the Chakraborty Confirmation Report, I discussed the Board's Revenue Envelope and Legacy Charge Model, and the inputs assumed in this model to estimate the Revenue Envelope and Legacy Charge. I identified methodological flaws and unsupportable assumptions underlying the Board's calculations that, when corrected, significantly increased the amount of Additional Net Revenues that PREPA can reasonably collect while remaining well within the Board's own view of what is affordable for PREPA's customers. Specifically:

- The Board miscalculates electricity consumption for its Hypothetical Residential Customer, thereby causing an error in the calculation of the ceiling on the affordable rates that could be charged to the Hypothetical Residential Customer and PREPA customers more generally. Holding all else equal, correcting this error increases PREPA's Additional Net Revenues available for servicing the New Bonds from $5.68 billion to as much as $8.96 billion, a difference of $3.28 billion.[9]
- The Board incorrectly assumes that median income in Puerto Rico will remain constant over a multi-decade period, contrary to the Board's own assumptions of median income growth at the rate of inflation between 2021 and 2024. This leads the Board to understate the maximum affordable electricity rates for (i) the Hypothetical Residential Customer, (ii) all residential customers in the Hypothetical Residential Customer's rate class, "GRS 112 (General)," and (iii) all other customer rate classes, given that electricity rates for these classes are, in the Board's model, a function of the electricity rates the Board determined

[9] *See* Chakraborty Confirmation Report, ¶ 53 and Exhibit 10. This calculation is based on a 2024 median monthly consumption of 372 kWh. Assuming a 2024 median monthly consumption of 400 kWh, PREPA's Additional Net Revenues available for servicing the New Bonds increase from $5.68 billion to $7.19 billion, a difference of $1.51 billion. *See id*.

for the "GRS 112 (General)" residential rate class. Holding all else equal, correcting this error increases PREPA's Additional Net Revenues available for servicing the New Bonds from $5.68 billion to $6.57 billion, a difference of $892 million.[10]

- The Board does not conduct an affordability analysis of the electricity rates that could be charged to higher-income residential customers or non-residential customers, comprising commercial, industrial, government, and municipal rate classes. Holding all else equal, an increase of 2.5 cents per kWh to the rates charged to non-residential customers increases PREPA's Additional Net Revenues available for servicing the New Bonds from $5.68 billion to as much as $6.75 billion, a difference of $1.07 billion.[11]
- The Board employs a load forecast that, in the opinion of Dr. Susan Tierney, was understated.[12] Holding all else equal, Dr. Tierney's revised load forecasts increase PREPA's Additional Net Revenues available for servicing the New Bonds from $5.68 billion to as much as $6.24 billion, a difference of $564 million.[13]

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10 *See* Chakraborty Confirmation Report, ¶ 58 and Exhibit 11.

11 *See* Chakraborty Confirmation Report, ¶ 71 and Exhibit 16. Excluding incremental Additional Net Revenues of $308 million pertaining to rate class GSS 211, Additional Net Revenues increase from $5.68 billion to $6.44 billion, a difference of 13 percent. *See id.*

Holding all else equal, an increase of 1.0 cents per kWh to the rates charged to non-residential customers increases PREPA's Additional Net Revenues available for servicing the New Bonds from $5.68 billion to $6.15 billion, a difference of $471 million. Excluding incremental Additional Net Revenues of $128 million pertaining to rate class GSS 211, Additional Net Revenues increase from $5.68 billion to $6.02 billion, a difference of six percent. *See id.*

12 *See* Expert Report of Susan Tierney, PhD, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, April 28, 2023 ("Tierney Confirmation Report"), Section V.

13 *See* Chakraborty Confirmation Report, ¶ 78 and Exhibit 17. This calculation is based on Dr. Tierney's Third Revised Net Load Forecast. Based on Dr. Tierney's First Revised Net Load Forecast, PREPA's Additional Net Revenues available for servicing the New Bonds increase from $5.68 billion to $5.75 billion, a difference of $70 million. Based on Dr. Tierney's Second Revised Net Load Forecast, PREPA's Additional Net Revenues available for servicing the New Bonds increase from $5.68 billion to $5.93 billion, a difference of $246 million. *See id.*

- The Board employs price elasticities that, in the opinion of Dr. Tierney, were overstated.[14] Holding all else equal, correcting the elasticity rates increases PREPA's Additional Net Revenues available for servicing the New Bonds from \$5.68 billion to \$5.97 billion, a difference of \$290 million.[15]

12. Dr. George neither identifies these issues with the Board's analysis nor provides a reasonable justification for the Board's methods. I also reviewed Mr. Zarakas's deposition testimony, in which he (i) acknowledged potential errors requiring correction in the Board's calculation of the median-income household's electricity consumption that the Board's advisors are now reconsidering;[16] (ii) explained that, at the express instruction and direction of the Board's counsel, the Revenue Envelope and Legacy Charge Model does not account for income growth;[17] and (iii) confirmed that no "affordability analysis" was performed to ascertain what PREPA's non-residential customer classes could pay to service the New Bonds, and that the Board instead determined a Legacy Charge for such classes through a set of highly subjective adjustments.[18] I reserve the right to review and opine on any revised consumption estimate later offered by the

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14 *See* Tierney Confirmation Report, Section VII.

15 *See* Chakraborty Confirmation Report, ¶ 85 and Exhibit 19.

16 *See* Zarakas Transcript, pp. 96-98 ("Q. The fiscal year, PREPA's fiscal year doesn't match up with the calendar year; correct? A. That's right. Q. … In determining the average 2021 rate to use in Exhibit 42, did you consider using an average of the two fiscal year rates that would apply to Calendar Year 2021? A. At the time, no. Q. Have you considered doing an analysis like that since? A. Yes. Q. Have you performed such analysis? A. We are looking at the PRCS data in much greater detail. Q. How so? A. Looking at the data, there's some data that might need to be excluded in coming up with the average consumption. … Q. As you sit here today … do you know if Brattle has concluded that the average 2021 rates should be something different than 18.76 cents a kilowatt hour? A. I don't know at this time.").

17 *See* Zarakas Transcript, pp. 78-80 ("Q. Well, you chose not to conduct this analysis by increasing the median household income by inflation, correct? A. Correct. Q. Why did you make that choice? A. In collaboration with the board, we looked at future uncertainties, as well as overall policy target. … Q. … Were you instructed in calculating affordability for residential customers not to grow the median income by inflation? A. Yes. … Q. … You were instructed by the oversight board not to grow the median income by inflation for purposes of calculating residential affordability in the revenue envelope model? A. Yes.").

18 *See* Zarakas Transcript, p. 41 ("Q. And was there any corresponding affordability test applied to non-residential PREPA customers? A. No.").

Board, and my criticisms of the Board's approach to determining a Legacy Charge for non-residential customer classes are unchanged after reviewing Mr. Zarakas's explanation of that approach.

13. In the balance of this section, I discuss in more detail these significant issues with the Board's analysis that Dr. George does not identify or adequately address. In my opinion, several of these issues would certainly qualify as "material calculation errors."[19]

A. Dr. George Fails to Identify and Address a Material Error in the Board's Estimation of Electricity Consumption, Which Results in an Understatement of Additional Net Revenues of More Than $3 Billion

14. As I explained in the Chakraborty Confirmation Report, a key parameter of the Board's estimation of the Legacy Charge is the assumption that the Hypothetical Residential Customer, with the median household income, consumes 425 kWh of electricity monthly.[20] The Board uses that consumption estimate to determine the Hypothetical Residential Customer's baseline electricity cost, in fiscal year 2024, using PREPA's existing rates. An overestimation of the Hypothetical Residential Customer's electricity consumption would overstate its baseline electricity cost, and thus understate the additional rates and charges that the Hypothetical Residential Customer can afford to pay under the Board's six percent Electricity SOW threshold.

15. To arrive at its 425 kWh monthly consumption estimate, the Board:

(i) Calculated the median annual electricity bill among relevant households

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19 George Confirmation Report, ¶ 13 ("In my review of the Revenue Envelope Model and Legacy Charge Model, I identified no material calculational errors or divergence from practices generally applied in the field of utility ratemaking.").

20 *See* Chakraborty Confirmation Report, Section IV.A.

during the 2021 *calendar year*, which was $960.[21]

(ii) Divided $960 by PREPA's average residential electricity rate of $0.1876 per kWh during the 2021 *fiscal year*, yielding an assumed median electricity consumption estimate of roughly 5,100 kWh per year and 425 kWh per month.[22]

(iii) Assumed that median electricity consumption in 2024 would also be roughly 5,100 kWh per year and 425 kWh per month.[23]

16. The Board's arithmetic suffers from an "apples-to-oranges" error, which stems from the fact that PREPA's fiscal year does not align with the calendar year. As I described above, the Board divided (i) the median annual electricity bill among relevant households from January 2021 through December 2021 (*i.e.*, the 2021 calendar year) of $960 by (ii) PREPA's average residential electricity rate from July 2020 through June 2021 (*i.e.*, PREPA's 2021 fiscal year) of $0.1876 per kWh. At his deposition, Mr. Zarakas confirmed that the Board's advisors misaligned calendar year billing data and fiscal year rate data in estimating median household electricity

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21 The Board excluded households that did not report an annual electricity bill, households with no charge or no electricity use, and households the electricity costs of which were included in their rent or condominium fees. *See* Chakraborty Confirmation Report, ¶ 47, fn. 42. *See also* Chakraborty Confirmation Report, Exhibit 8.

22 *See* Chakraborty Confirmation Report, ¶ 47 and Exhibit 8.

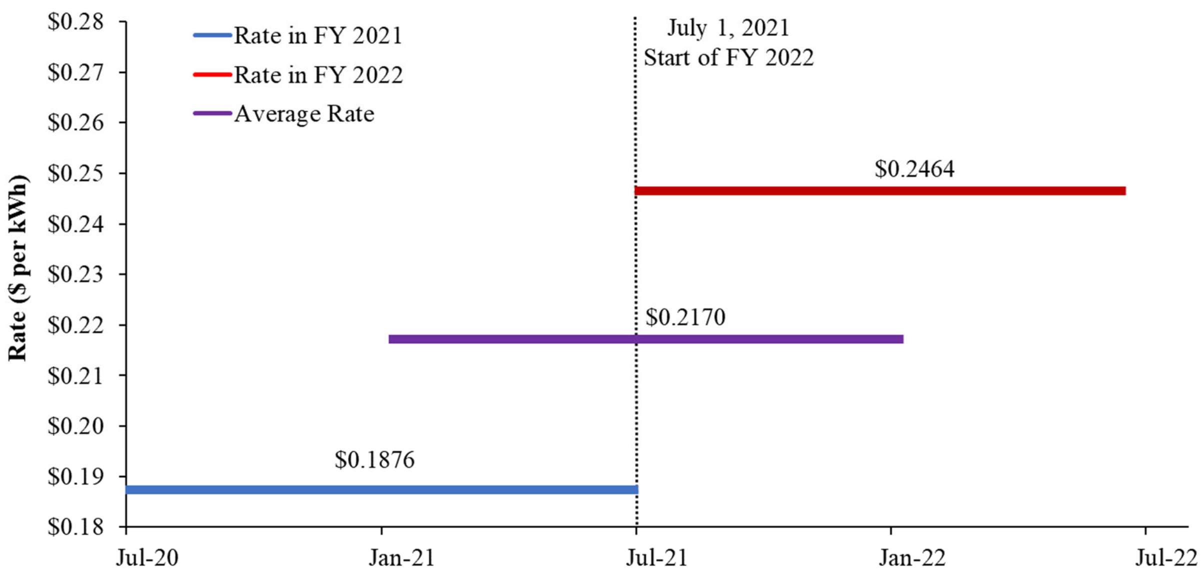
23 *See* Chakraborty Confirmation Report, ¶ 47, fn. 43 ("The Board estimates that 2024 median residential consumption will be 430 kWh but ultimate assumes the 2024 median residential consumption will equal 425kWh. See KWh Consumption.xlsx, FOMB_PREPA00022592.").

See also George Confirmation Report, ¶ 56, fn. 67 ("I note that the 2024 monthly median consumption as calculated is 430 kWh. However, Brattle elected to use 425 kWh due in part because the load forecast data for 2021-2024 in the 2022 Fiscal Plan only accounted for energy efficiency effects from residential lighting and no other sources such as air conditioning, for example. As such, it is possible that load will be lower than forecast because of this omission. Brattle accordingly reduced its 2024 median monthly volumetric consumption to account for this.").

consumption.[24]

17. This is not a trivial error. PREPA's average residential electricity rate in fiscal year 2022 was $0.2464 per kWh—that is, it was more than 30 percent higher than PREPA's average residential electricity rate in fiscal year 2021 of $0.1876 per kWh. **Figure 1** below illustrates this difference.

Figure 1
PREPA's Rates in Fiscal Year 2021 and Fiscal Year 2022



Source:
[1] PREPA 2022 Fiscal Plan Model.xlsx, FOMB_PREPA 00003018.

18. In the Chakraborty Confirmation Report, I accounted for the fact that PREPA's rate was $0.1876 per kWh in fiscal year 2021, which covers the first six months of the 2021 calendar year, and was $0.2464 per kWh in fiscal year 2022, which covers the last six months of the 2021 calendar year, by using the average of these two rates ($0.2170 per kWh) as an approximate

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24 *See* Zarakas Transcript, pp. 96-97 ("Q. The fiscal year, PREPA's fiscal year doesn't match up with the calendar year; correct? A. That's right. Q. … In determining the average 2021 rate to use in Exhibit 42, did you consider using an average of the two fiscal year rates that would apply to Calendar Year 2021? A. At the time, no. Q. Have you considered doing an analysis like that since? A. Yes. Q. Have you performed such analysis? A. We are looking at the PRCS data in much greater detail.").

calendar year 2021 rate.[25] Dividing the median 2021 calendar year electricity bill of $960 by this blended calendar year rate yields an estimate of median 2021 calendar year consumption of roughly 4,424 kWh, or 369 kWh per month.[26]

19. I corroborated this estimate in two ways. First, using data from the EIA, I estimated median 2021 calendar year consumption of 378 kWh per month.[27] Second, using data from LUMA, I estimated median 2021 calendar year consumption of 386 kWh per month.[28]

20. I then accounted for changes in consumption levels between 2021 and 2024 using the Board's method for doing so, which yielded an estimate of median monthly consumption in 2024 of 372 kWh.[29]

21. The Board's estimate of the Legacy Charge and resulting Additional Net Revenues is highly sensitive to this input. As I explained in the Chakraborty Confirmation Report, assuming median monthly consumption in 2024 of 372 kWh rather than the Board's miscalculated estimate of 425 kWh **increases Additional Net Revenues from $5.68 billion to $8.96 billion, *a difference of nearly $3.28 billion***.[30]

22. While Dr. George appears to have examined the Brattle Group's calculations

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25 *See* Chakraborty Confirmation Report, ¶ 49 and Exhibit 8.

26 *See* Chakraborty Confirmation Report, ¶ 49 and Exhibit 8.

27 *See* Chakraborty Confirmation Report, ¶ 50 and Exhibit 8.

28 *See* Chakraborty Confirmation Report, ¶ 51 and Exhibit 9.

29 *See* Chakraborty Confirmation Report, ¶ 52, fn. 45 ("I apply the Board's approach to infer what median 2021 consumption would be in 2024. In their approach, the Board uses data on residential gross consumption (less residential lighting savings) and the number of residential customers to calculate average consumption per customer each year 2021–2024; values from 2022–2024 are projections. The Board then calculates the year-to-year percentage changes in average consumption. To infer what median 2021 consumption would be in 2024, the Board then assumes that year-to-year percentage changes in median consumption will be the same as their calculated percentage changes in average consumption.").

30 *See* Chakraborty Confirmation Report, ¶ 53 and Exhibit 10.

regarding electricity consumption, he either did not realize that PREPA's fiscal year does not align with the calendar year or he failed to appreciate the significance of this mismatch.[31] In my opinion, this calculation error qualifies as material given its significant effect on PREPA's Revenue Envelope and Additional Net Revenues available for servicing the New Bonds.

B. Dr. George Fails to Identify and Address a Material Omission in the Board's Projections of Income, Which Results in an Understatement of Additional Net Revenues of Nearly $1 Billion

23. As I explained in the Chakraborty Confirmation Report and above, the Board's estimate of the Legacy Charge and resulting Additional Net Revenues is based on, among other variables, an assumed median household income in 2021 of $21,967. The Board then increased this amount by projected inflation between 2021 and 2024 to estimate median household income in 2024 of $24,000.[32]

24. Even though (i) the Board recognized the need to adjust assumed fiscal year 2021 median income by inflation to determine fiscal year 2024 median income, and (ii) the Board's own fiscal plans for the Commonwealth and PREPA reflected a projected annual inflation rate of 1.7 percent, the Board made no corresponding adjustment to income over the subsequent 35 years of the projection period.[33] Mr. Zarakas testified that this failure to account for future income growth

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[31] *See* George Confirmation Report, ¶ 56 ("When setting the appropriate fixed and volumetric charges to generate the Revenue Envelope while staying within the 6% SOW affordability constraint, the Oversight Board first considered how much electricity the typical residential customer would consume per month (i.e., volumetric consumption) in FY 2024. Volumetric consumption for residential customers was estimated using annual median electricity cost **in 2021** and the mean rate PREPA charged said customers **in the same year**. I find it appropriate to use an annual median electricity spend (in dollars) and an annual mean rate (in cents per kWh) to perform this calculation, because (among other reasons) there are relatively few extreme outliers in terms of spend. Accordingly, the median monthly volumetric consumption for residential customers in 2024 was estimated to be 425 kWh using this methodology.") (emphasis added).

[32] *See* Chakraborty Confirmation Report, ¶ 55.

[33] *See* Legacy Charge Derivation, p. 5, fn. 3 ("Pursuant to the U.S. Census, median 2021 household income was estimated to be $21,967 for the period 2017-2021, expressed in 2021 dollars. See

Case:17-04780-LTS Doc#:3505-21 Filed:06/12/23 Entered:06/12/23 21:59:46 Desc: Exhibit AHG Ex 21 2023-05-15 Chakraborty Rebuttal Report (Dkt 15031) Page 16 of 35

was at the explicit direction of the Board.[34] Neither Dr. George nor Mr. Zarakas have cited to any data or support, from academic literature or otherwise, for the notion that nominal incomes are expected to remain constant over a multi-decade period.

25. Dr. George acknowledges and agrees with the Board's adjustment of 2021 median income to account for inflation between 2021 and 2024, stating that he "reviewed the methodology described [in the Legacy Charge Derivation exhibit to the Disclosure Statement] and find it to be sound and reasonable."[35] Moreover, Dr. George recognizes that income growth is a key driver of whether the Legacy Charge will prove to be affordable to residential consumers.[36] Nevertheless, Dr. George either did not identify the Board's implausible assumption of no nominal growth in median income over a decades-long period, or does not view this no-growth assumption as a "material calculation error."

26. As I discussed in the Chakraborty Confirmation Report, the Board's no-growth assumption is implausible, and very material.[37] **Figure 2** below compares (i) median income under

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https://data.census.gov/table?q=Insurance,+Utilities,+and+Other+Fees&g=0400000US72&tid=ACSST5Y2021.S2503. Pursuant to Fiscal Plan inflation assumptions, such median household income in 2024 is estimated to be approximately $23,824."); Chakraborty Confirmation Report, ¶¶ 54-55.

34 *See* Zarakas Transcript, pp. 78-80 ("Q. Well, you chose not to conduct this analysis by increasing the median household income by inflation, correct? A. Correct. Q. Why did you make that choice? A. In collaboration with the board, we looked at future uncertainties, as well as overall policy target. … Q. … Were you in calculating affordability for residential customers not to grow the median income by inflation? A. Yes. … Q. … You were instructed by the oversight board not to grow the median income by inflation for purposes of calculating residential affordability in the revenue envelope model? A. Yes.").

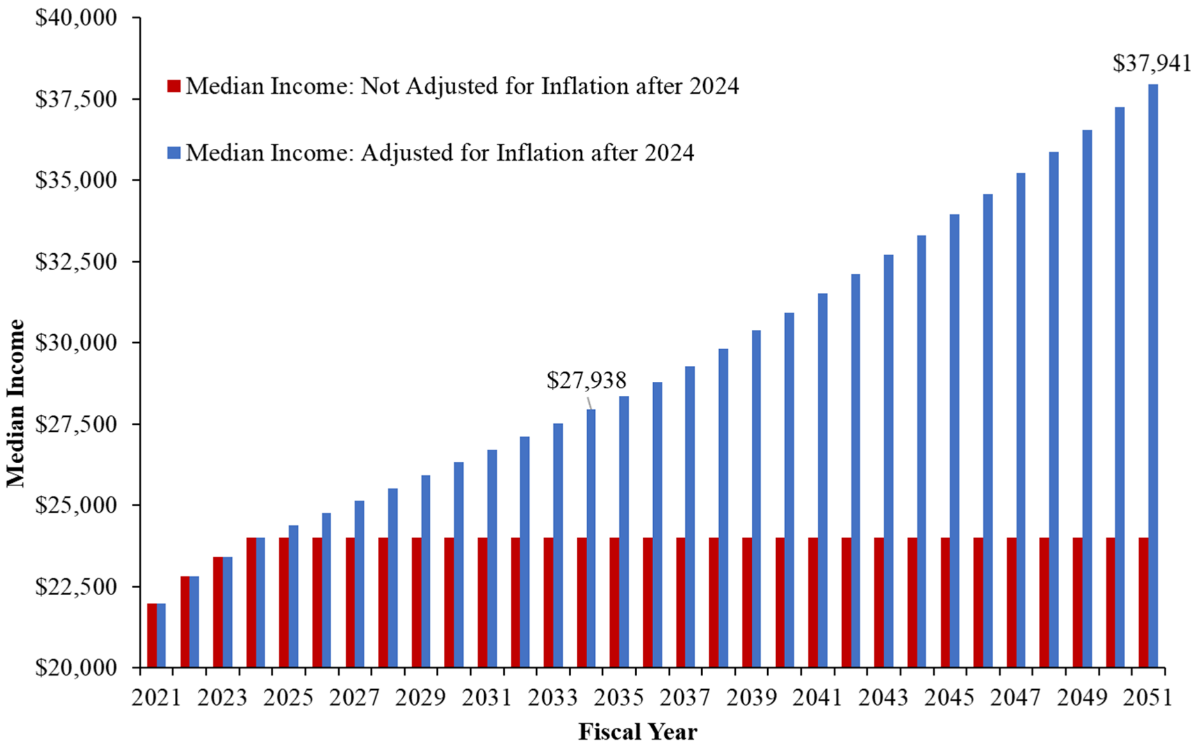
35 George Confirmation Report, ¶ 37. *See also id.*, fn. 32 ("The median 2021 household income—estimated to be $21,967 in 2021 dollars—**was adjusted for inflation** pursuant to the 2022 Fiscal Plan assumptions to arrive at the estimated 2024 median household income of $23,824. This amount was rounded up to the nearest thousand dollars to arrive at $24,000. **This estimate is reported in 2024 dollars** because the Legacy Charge is expected to be implemented in 2024.") (emphasis added).

36 *See* George Confirmation Report, ¶ 42 ("The actual SOW for electricity for residential customers in Puerto Rico may of course fluctuate over time. Aside from the fact that approximately half of households in Puerto Rico could spend more than 6% of their household income on electricity in 2024 and beyond, **there are other uncertainties which could make the actual SOW higher or lower than 6% (e.g., income growth**, fuel prices)."). (emphasis added)

37 *See* Chakraborty Confirmation Report, ¶¶ 54-55.

the Board's analysis with (ii) median income adjusted for inflation when using the Board's own inflation forecast per PREPA's certified 2022 Fiscal Plan.[38]

Figure 2
The Effect of Inflation on Income



Sources:
[1] "Revenue Envelope and Legacy Charge Derivation Workbook," received March 11, 2023 ("Revenue Envelope and Legacy Charge Derivation Workbook").
[2] January 2022 Fiscal Plan Model Certified (Dataroom).xlsx, FOMB_PREPA00020359.
[3] U.S. Census Bureau, Puerto Rico Community Survey 2021 5-Year Estimates, available at https://data.census.gov/table?q=median+household+income+in+puerto+rico+&tid=ACSST5Y2021.S1901

27. From 2021 through 2024, the heights of the two columns are identical given that the Board's analysis did account for inflation during these years.

28. By fiscal year 2034, however, median income adjusted for inflation is $27,938, 16 percent greater than 2024 median income. And, by fiscal year 2051, median income adjusted for inflation is $37,941, 58 percent greater than 2024 median income. In other words, electricity costs

[38] Median income adjusted for inflation in 2024 was $23,824, which the Board rounded up to $24,000. *See* Legacy Charge Derivation, p. 5, fn. 3; George Confirmation Report, ¶ 37, fn. 32.

that would equal 6.0 percent of a median-income household's monthly income in fiscal year 2024 will equal 3.8 percent of a median-income household's monthly income in fiscal year 2051.

29. Unsurprisingly, accounting for reasonable growth in income levels over a long time period has significant implications for the amount of Additional Net Revenues that PREPA is capable of collecting. As I demonstrate in the Chakraborty Confirmation Report, applying the certified 2022 Fiscal Plan's inflation forecast to 2024 median income over the forecast period of the Board's Revenue Envelope and Legacy Charge Model **increases Additional Net Revenues from $5.68 billion to $6.57 billion, *a difference of $892 million*.**[39]

30. Lastly, I note my disagreement with Dr. George's view that 2021 median income of $21,967 may have been overstated. Advancing an argument that also appears in the Legacy Charge Derivation exhibit to the Disclosure Statement, Dr. George contends that household income reporting may have been "inflated" due to non-recurring federal income support pertaining to COVID relief and stimulus payments.[40] Such funds, however, were designed to *replace* income

[39] *See* Chakraborty Confirmation Report, ¶¶ 57-58 and Exhibit 11.

[40] *See* George Confirmation Report, ¶ 37, fn. 32 ("The median 2021 household income—estimated to be $21,967 in 2021 dollars—was adjusted for inflation pursuant to the 2022 Fiscal Plan assumptions to arrive at the estimated 2024 median household income of $23,824. This amount was rounded up to the nearest thousand dollars to arrive at $24,000. The estimate is reported in 2024 dollars because the Legacy Charge is expected to be implemented in 2024. Moreover, the Census Bureau noted that household income reporting in the 2020 Survey may include non-recurring federal income support (e.g., COVID relief and stimulus payments), **which would tend to inflate household incomes**."). (emphasis added)

See also Legacy Charge Derivation, p. 5, fn. 3 ("Pursuant to the U.S. Census, median 2021 household income was estimated to be $21,967 for the period 2017-2021, expressed in 2021 dollars…. Pursuant to Fiscal Plan inflation assumptions, such median household income in 2024 is estimated to be approximately $23,824. Notably, however, the U.S. Department of Commerce suggests caution when using income estimates for 2020 and 2021. The 2020 Survey did not meet the quality requirements of the U.S. Census due to COVID and therefore was not released. The 2021 survey has inconsistent reporting of transfer payments due to inclusion of non-recurring federal income support such as COVID relief and stimulus payments, supplemental unemployment insurance benefits and advance child tax credit payments.").

that was lost as a result of COVID, rather than to *increase* income to be consistent with pre-COVID income levels.[41]

C. Dr. George Fails to Identify and Address the Board's Arbitrary Method of Estimating Rates for Non-Residential Customers, Which Results in an Understatement of Additional Net Revenues of Up to $1 Billion

31. As I discussed in the Chakraborty Confirmation Report, the Board derives maximum rates for commercial, industrial, government, and municipal customers by making highly subjective adjustments to the rates it deems affordable for the Hypothetical Residential Customer.[42] There is, however, no logical connection between (i) the rates that might be affordable for non-residential classes of customers and (ii) the rates deemed affordable for the Hypothetical Residential Customer based on an assumed six percent SOW threshold. The affordability considerations of non-residential customers differ considerably from those of a residential household, and yet the Board did not conduct any analysis of affordability thresholds for any customer class other than the residential class. As such, the Board does not offer a supportable basis for determining the rates applicable to customer classes that together consume the majority of the electricity that PREPA supplies.[43]

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41 In addition, as I discuss in the Chakraborty Confirmation Report and further below, the Board's median income assumptions also ignore the large informal economy that exists in Puerto Rico. *See* Chakraborty Confirmation Report, ¶ 11, fn. 8; *infra*, Section IV.A.

42 *See* Chakraborty Confirmation Report, ¶ 65. *See also* Legacy Charge Derivation, pp. 5-6, fn. 6 ("To estimate the Revenue Envelope the combination of additional fixed and volumetric charges estimated to result in the maximum additional revenue that could be generated from (nonexempt) Residential customers was then scaled to Commercial and Industrial customers, with differences in elasticities appropriate for those customer classes being taken into account. Specifically, the ratio of total fixed monthly fee (current plus Legacy Charge fixed fee) to the current fixed monthly fee was applied to determine fixed fee increases for other customer classes. For volumetric rates, a combination of assumed elasticities for non-Residential customer classes and the range of average volumetric charge increases across the range of residential customers was used to develop multipliers between 25% and 100% for non-Residential classes.").

43 *See* Chakraborty Confirmation Report, ¶ 17 ("While only approximately 8.3% of PREPA's customers are industrial and commercial customers, their aggregate consumption is high and they contribute 56.3% to

32. Regarding the Board's method of deriving rates for non-residential classes of customers, Dr. George states only the following:

> Different price elasticities are applied to each residential and non-residential customer class. Adjustments were made for certain customer classes based on expert judgment of likely switching behavior for that customer class.[44]

33. Mr. Zarakas confirmed at his deposition that the Board's determination of rates for non-residential customers was not based on any assessment of the rates that those customers could actually afford:

> Q. When you say the affordability is primarily for residential customers, what do you mean by that?
>
> A. The affordability test, some called it wallet [share], or it's a percentage of spending on electricity. I should say it's the amount spent on electricity as a percentage of income -- in this case median income -- was the test that we applied for affordability.
>
> Q. And was there any corresponding affordability test applied to non-residential PREPA customers?
>
> A. No.[45]

34. In the Chakraborty Confirmation Report, I determined that the increase in non-residential customers' electricity costs implied by the Board's analysis would be very small, such that these customers could likely afford to pay more for electricity.[46]

35. Increasing the maximum rates applicable to non-residential customers by one cent

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PREPA's total revenues."); U.S. Energy Information Administration, "Puerto Rico Territory Energy Profile," last updated January 19, 2023, https://www.eia.gov/state/print.php?sid=RQ# ("The commercial sector consumes about 45% of Puerto Rico's electricity, the residential sector accounts for 43%, and the industrial sector makes up about 11%.").

44 George Confirmation Report, ¶ 49.

45 *See* Zarakas Transcript, pp. 40-41.

46 *See* Chakraborty Confirmation Report, ¶¶ 66-69.

in the Board's model, I found that Additional Net Revenues increased from $5.68 billion to $6.15 billion, a difference of eight percent.[47] Increasing the maximum rates applicable to non-residential customers by 2.5 cents in the Board's model, I found that **Additional Net Revenues increased from $5.68 billion to as much as $6.75 billion, *a difference of 1.07 billion***.[48]

D. Dr. George Misunderstands the Implications of an Understated Load Forecast on the Revenue Envelope, Which Results in an Understatement of Additional Net Revenues of Up to $564 Million

36. Dr. Tierney addresses the George Confirmation Report with respect to PREPA's forecasts of customer loads.[49] Dr. Tierney references Dr. George's claim that PREPA's forecasts for fiscal years 2017 through 2022 "on average […] **over**estimated load by about 2%."[50] Dr. Tierney explains that Dr. George misinterprets PREPA's forecasts, that those forecasts actually **under**estimate net load by an average of 5.42 percent, and that the Board has underestimated load in virtually every year since it began forecasting electricity consumption.[51]

37. Dr. George asserts that "the primary risk [he] considered was the situation where

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47 *See* Chakraborty Confirmation Report, ¶¶ 70-72 and Exhibit 16.

48 *See* Chakraborty Confirmation Report, ¶¶ 70-72 and Exhibit 16. Excluding incremental Additional Net Revenues of $308 million pertaining to rate class GSS 211, Additional Net Revenues increased from $5.68 billion to $6.44 billion, a difference of 13 percent. *See id.*

Increasing the maximum rates applicable to non-residential customers by 1.0 cents in the Board's model, I found that Additional Net Revenues increased from $5.68 billion to $6.15 billion, a difference of eight percent. Excluding incremental Additional Net Revenues of $128 million pertaining to rate class GSS 211, Additional Net Revenues increased from $5.68 billion to $6.02 billion, a difference of six percent. *See id.*

49 *See* Expert Rebuttal Report of Susan Tierney, PhD, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 15, 2023 ("Tierney Confirmation Rebuttal Report"), Section V.

50 George Confirmation Report, ¶ 101 (emphasis added).

51 *See* Tierney Confirmation Rebuttal Report, Section V, Table 1; Tierney Confirmation Report, Section VI.

PREPA's forecasts had **over**estimated load."[52] He focused on this scenario because:

> The situation in which load is **under**estimated is not a significant source of financial risk, because greater load than has been modeled would lead to increased revenue and an enhanced ability to service and pay off PREPA's debt more quickly.[53]

38. Dr. George misunderstands how the Board's Revenue Envelope and Legacy Charge Model works. The recovery is set based on the load forecast. Specifically, a forecast of total electricity demand (*i.e.*, load) that is overly pessimistic or understated will *reduce*, not *increase*, the projected amount of Additional Net Revenues PREPA will collect, all else equal.[54] A lower estimated NPV of future Additional Net Revenues will lead to a lower determination of the recovery that is made available to Bondholders and other creditors.

39. In the Chakraborty Confirmation Report, I calculated Additional Net Revenues based on three revised net load forecasts loads that, in Dr. Tierney's opinion, are grounded in more realistic assumptions than the load forecasts included in PREPA's 2022 Fiscal Plan.[55] Future load in all three of Dr. Tierney's revised net load forecasts is higher than the load forecasts in the 2022

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[52] George Confirmation Report, ¶ 100 (emphasis added).

[53] George Confirmation Report, ¶ 100.

I understand that there is a Contingent Value Instrument ("CVI") that is being issued in addition to the New Bonds. I also understand that the terms of the CVI differ from those of the New Bonds, and that they mature 15 years earlier than the New Bonds. Thus, it is not clear that the CVI could compensate for an underestimated load forecast. *See* Expert Report of Gary Strumeyer, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, April 28, 2022, ¶¶ 112-118.

[54] *See* Chakraborty Confirmation Report, ¶¶ 73-78 and Exhibit 17.

[55] *See* Chakraborty Confirmation Report, ¶¶ 73-78 and Exhibit 17.

Fiscal Plan. **Holding all else equal, I found that Additional Net Revenues increased from $5.68 billion to as much as $6.24 billion, *a difference of $564 million*.**[56]

E. Dr. George Does Not Consider Alternative Price Elasticities, which Increase Additional Net Revenues by Nearly $300 Million

40. Dr. Tierney addresses the George Confirmation Report with respect to the price elasticities that the Board employed in its Revenue Envelope and Legacy Charge Model.[57] Dr. Tierney previously found that the Board overestimates the demand response to increases in electricity rates, thereby overstating the impact of an increase in volumetric rates on load and Fixed Cost Under-Recovery.[58]

41. As I described in the Chakraborty Confirmation Report, when adopting the price elasticity estimates that Dr. Tierney identified, I found that **Additional Net Revenues increased from $5.68 billion to $5.97 billion, *a difference of $290 million*.**[59]

42. Lastly, I note that the Board and its advisors have proposed in different settings three rate structures that differ in whether the rate charged to customers has a fixed component, a volumetric component, or a combination of both. First, the Board assumes a rate comprising both a fixed component and a volumetric component in its Revenue Envelope and Legacy Charge Model.[60] Second, in relation to the estimation of the Unsecured Net Revenue Claim, David Plastino of the Brattle Group has offered a model in which he assumes that any electricity rate increase for

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56 *See* Chakraborty Confirmation Report, ¶ 78 and Exhibit 17.

57 *See* Tierney Confirmation Rebuttal Report, Section IV.

58 *See* Chakraborty Confirmation Report, ¶ 80, citing Tierney Confirmation Report, Section VII.

59 *See* Chakraborty Confirmation Report, ¶¶ 83-85 and Exhibit 19.

60 *See* Chakraborty Confirmation Report, ¶ 27.

the purpose of collecting additional revenue would be applied solely through a fixed charge (*i.e.*, he assumes no additional volumetric charge).[61] Third, McKinsey, another advisor to the Board, developed a "best interest test" model in which they assume that any electricity rate increase for the purpose of collecting Additional Net Revenues would be applied solely through a volumetric charge.[62] As I discussed in the Chakraborty Confirmation Report, the composition of the rate has significant implications in the estimation of Additional Net Revenues.[63]

IV. THE LEGACY CHARGE IS AFFORDABLE TO RESIDENTIAL CONSUMERS OF ELECTRICITY IN PUERTO RICO

43. In this Section, I first address Dr. George's suggestion that the Board's Electricity SOW threshold of six percent is the ceiling of what is affordable. I then describe how the imposition of the Legacy Charge would not cause most households in Puerto Rico to have an Electricity SOW that approaches this threshold.

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61 *See* Expert Report of David Plastino, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors*, PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 5, 2023, ¶ 37 ("The approach used in the POA estimated detailed rate structure for different customer classes and electricity consumption levels and forecasts incremental revenue using a blend of fixed charges and volumetric rates. However, the 2017 Plan does not provide the same detailed, customer-level information as the 2022 Fiscal Plan (on which the POA analysis is based). **Therefore, my model assumes that PREPA would raise incremental revenue through an incremental fixed charge although, in reality, a fixed charge, volumetric charge, or some combination of the two might be applied.** The use of a fixed charge likely results in higher levels of incremental revenue than would be the case if an incremental volumetric charge was used. This is because higher volumetric rates would result in the loss of sales as some customers would choose to consume less electricity by conserving energy or using substitutes, such as rooftop photovoltaics.") (emphasis added).

62 *See* "Model – Recovery Analysis PREPA Title III Dismissed.xlsx.xlsx," FOMB_PREPA 00003017.

63 *See* Chakraborty Confirmation Report, ¶ 63.

A. Dr. George Gives the False Impression that the Board's Electricity SOW Threshold Represents the Upper Bound of Affordability

44. As I explained in the Chakraborty Confirmation Report, a key parameter of the Board's estimation of the Legacy Charge is the assumption that residential consumers of electricity should not pay more than six percent of their monthly income on electricity.[64] This six percent electricity share of wallet ("Electricity SOW") is, in turn, derived in the relevant literature from two underlying assumptions regarding affordability:

- First, that a shelter cost share of wallet ("Shelter SOW") of no more than 30 percent is affordable. Shelter costs include both electricity costs and non-electricity costs such as mortgage payments, real estate taxes, and property insurance.[65]

- Second, that an electricity cost of no more than 20 percent of total shelter costs is affordable.[66]

45. Taken together, these two assumptions imply that an Electricity SOW of no more than 30 percent × 20 percent = 6 percent is affordable.

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64 *See* Chakraborty Confirmation Report, pp. 5-6.

65 *See*, *e.g.*, Schwartz, Mary and Ellen Wilson, "Who Can Afford to Live in a Home? A Look at Data from the 2006 American Community Survey," *U.S. Census Bureau*, 2006, p. 1 ("The conventional public policy indicator of housing affordability in the United States is the percent of income spent on housing. Housing expenditures that exceed 30 percent of household income have historically been viewed as an indicator of a housing affordability problem. The conventional 30 percent of household income that a household can devote to housing costs before the household is said to be 'burdened' evolved from the United States National Housing Act of 1937."); Fisher, Sheehan & Colton, "Home Energy Affordability in New York: The Affordability Gap (2008 – 2010)," Prepared for New York State Energy Research Development Authority, June 2011, p. 2, fn. 1 ("It is universally accepted that total shelter costs are "unaffordable" if they exceed 30% of income.").

66 *See* Fisher, Sheehan & Colton, "Home Energy Affordability in New York: The Affordability Gap (2008 – 2010)," Prepared for New York State Energy Research Development Authority, June 2011, p. 2, fn. 1 ("The 6% is a calculated figure. It is based on the premise that utility costs should not exceed 20% of shelter costs. Moreover, it is based on the premise that total shelter costs should not exceed 30% of income.").

46. It is commonly accepted that a Shelter SOW of no more than 30 percent is affordable.[67] In contrast, there does not appear to be consensus regarding the maximum affordable Electricity SOW. For example, while some studies suggest that the maximum affordable Electricity SOW is six percent, others suggest that this threshold is 10 percent.[68]

47. In my opinion, and consistent with the literature on this subject, households' overall spending on total shelter costs—including but not limited to electricity—is also relevant in evaluating affordability considerations. Consider the following illustrative example.

48. Household A has an income of \$100, of which it spends \$6 on electricity and \$24 on non-electricity shelter costs. Thus, Household A's Electricity SOW is equal to \$6 ÷ \$100 = 6 percent, and its Shelter SOW is equal to (\$24 + \$6) ÷ \$100 = 30 percent.

49. Household B has the same income of \$100, of which it spends \$10 on electricity and \$20 on non-electricity shelter costs. Thus, Household B's Electricity SOW is equal to \$10 ÷ \$100 = 10 percent, and its Shelter SOW is equal to (\$20 + \$10) ÷ \$100 = 30 percent.

50. While Household B spends relatively more of its income (10 percent) on electricity than does Household A (6 percent), Household B spends relatively less of its income on non-electricity shelter costs than does Household A. Correspondingly, while the two households' Electricity SOWs differ, their Shelter SOWs are the same, as is the \$70 of income that each

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67 *See supra*, fn. 65.

68 *See supra*, fn. 66; Hernandez, Diana and Daniel Carrion, "Housing Hardship and Energy Insecurity Among Native-Born and Immigrant Low-Income Families with Children in the United States," *Journal of Children and Poverty*, March 2016, p. 3 ("Economic energy insecurity is defined in this study as spending greater than 10% of household income on utility expenses."); Hernandez, Diana, *et al.*, "Energy Insecurity among families with Children," National Center for Children in Poverty – Mailman School of Public Health, Columbia University, January 2014, p. 4 ("We … refer to households with more than 10 percent of energy burden as 'energy insecure.' This measure is based on the Department of Energy's annual estimates of homes that experience an energy affordability gap.").

household has remaining. Thus, whether a given amount of electricity cost is deemed affordable for a household depends on, among other things, the amount of that household's non-electricity shelter costs.

51. Dr. George suggests that the Board's Electricity SOW threshold of six percent for purposes of estimating the Legacy Charge represents an "upper bound" on available revenue. Specifically, he states:

> [A] a 6% SOW is often defined as a high energy burden. As of 2017, more than 25% of US households (30.6 million) faced a 'high energy burden' (i.e., SOW of more than 6%). In the 'South Atlantic' region (essentially the Middle Atlantic and Southeastern states), the median energy burden is 3.2%. By comparison, because the SOW calculation is based on median household income, this suggests that around half of households in Puerto Rico would spend more than 6% of their household income on electricity. In other words, about half of Puerto Rico residents would face a 'high energy burden' as a result of the Legacy Charge, further suggesting that the 6% SOW constraint for determining the Legacy Charge represents an upper bound on revenue available to service the New Bonds.[69]

52. There are multiple problems with Dr. George's above assertions. As an initial matter, Dr. George is mistaken that, "as a result of the Legacy Charge," roughly half of households in Puerto Rico would spend more than six percent of their incomes on electricity and thus face a "high energy burden." Dr. George bases that opinion on the fact that the Board performs its affordability calculations on a hypothetical median-income household making $24,000 a year in fiscal year 2024, and that (by definition) half of households make less than the median income. But Dr. George fails to appreciate that, under the Board's plan, households with incomes lower

[69] George Confirmation Report, ¶ 40. *See also id.*, ¶ 18 ("PREPA's 2022 Fiscal Plan … states that the SOW of electricity costs for residential customers in Puerto Rico was about 5.6% in 2021, whereas in the southeastern US the SOW was about 3.2% in 2019.").

than the median income will largely be exempt from paying the Legacy Charge.[70] Accordingly, the median-income household is close to the *lowest*-income household that will actually pay the full Legacy Charge.

53. With respect to Electricity SOW, Dr. George's comparison of Puerto Rico to states in the "South Atlantic" region of the United States is inapt for several reasons. First, as I mentioned in the Chakraborty Confirmation Report, electricity prices in Puerto Rico have historically been higher than in the mainland United States due to the challenges of providing electricity to an island.[71] Second, such a comparison disregards that non-electricity shelter costs are considerably lower in Puerto Rico than in the mainland United States.[72]

54. For instance, **Figure 3** below compares the Shelter SOW of households in Puerto Rico to the Shelter SOW of households in the South Atlantic. Specifically, **Figure 3** divides

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70 *See* Chakraborty Confirmation Report, ¶ 61, fn. 57 ("The approximately 50% of residential customers who earn less than $24,000 per year are largely exempt from paying any Legacy Charge (except for consumption over 500 kWh per month, at half the rate other residential customers would be charged for such consumption). Residential customers in the RH3, LRS, RFR, and GRS 112 (LC Subsidy Eligible) classes are exempt from the Incremental Flat Fee and the Incremental Volumetric Charge for consumption ≤ 500 kWh. These customer classes are assumed to have an Incremental Volumetric Charge (half that of GRS 112 (General) customers) for additional consumption > 500 kWh. See Revenue Envelope and Legacy Charge Derivation Workbook.").

See also Transcript of Deposition of David Skeel, *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of the Commonwealth of Puerto Rico, et al., Debtors,* PROMESA Title III No. 17-BK-3283-LTS, and *In re: The Financial Oversight and Management Board for Puerto Rico, as a representative of Puerto Rico Electric Power Authority, Debtor*, PROMESA Title III No. 17-BK-4780-LTS (Jointly Administered), United States District Court for the District of Puerto Rico, San Juan, Puerto Rico, May 2, 2023, pp. 91-92 ("Q. Mr. Skeel, was that a true statement at the time you made it, namely that under the February 9th plan, almost half of PREPA's residential customers wouldn't pay any legacy charge? A. I believe that was true, yes. Q. Do you believe that to remain true under the March 1st plan of adjustment? A. I think that is still true, yes.").

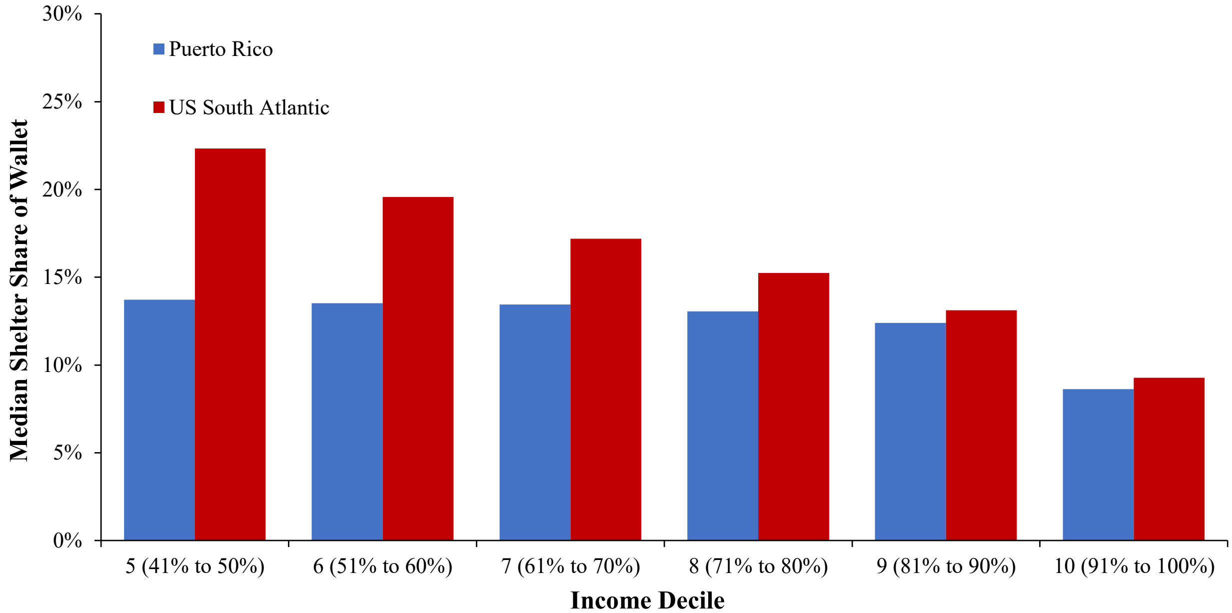
71 *See* Chakraborty Confirmation Report, ¶ 59. *See also* U.S. Energy Information Administration, "Puerto Rico Territory Energy Profile," last updated January 19, 2023, https://www.eia.gov/state/print.php?sid=RQ# ("Puerto Rico consumes almost 70 times more energy than it produces …. Puerto Rico's reliance on petroleum as a fuel for electricity generation contributes to the island having a higher average electricity price than any U.S. state, except for Hawaii…. The Commonwealth has some renewable resources in the form of solar, wind, hydropower, and biomass, but relies primarily on imported fossil fuels to meet its energy needs …. Petroleum accounts for about three-fifths of the energy consumed in Puerto Rico. The island imports all of its petroleum products ….").

72 *See* Chakraborty Confirmation Report, ¶ 59.

households in Puerto Rico and in the South Atlantic into deciles (*i.e.*, groups that each include 10 percent of households) that are ranked based on 2021 income levels. For example, 40 percent of households have *lower* income than the 5th decile, 10 percent of households have income *within* the 5th decile, and 50 percent of households have *higher* income than the 5th decile. The heights of the columns reflect the median Shelter SOW for households in Puerto Rico and in the South Atlantic, respectively, within the corresponding decile. I present the 5th through 10th deciles of households in **Figure 3** because these are the households that pay the vast majority of the Legacy Charge under the Board's analysis.

55. Across all income groups, the median Shelter SOW among households in Puerto Rico is lower than the median Shelter SOW among households in the South Atlantic. For example, for households in decile 5, which includes the median-income households in both Puerto Rico and in the South Atlantic region, the median Shelter SOW in Puerto Rico is 14 percent and the median Shelter SOW in the South Atlantic is 22 percent—that is, 57 percent higher than in Puerto Rico. Dr. George does not appear to have taken this into consideration when suggesting that the Board's Electricity SOW of six percent represents an upper bound.

Figure 3
Median Shelter Share of Wallet by 2021 Income Decile



Notes:
[1] Shelter SOW is calculated using the variables "OWNCOST" with respect to homeowners and "RENTGRS" with respect to renters.
[2] The South Atlantic region of the United States is defined to include the District of Columbia, Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia, which mirrors the definition of this region employed by the authors of the study on which Dr. George relies.

Sources:
[1] 2021 Puerto Rico Community Survey.
[2] 2021 American Community Survey.
[3] George Confirmation Report, ¶ 40.
[4] Drehobl, Ariel, et al., "How High Are Household Energy Burdens?," American Council for an Energy-Efficient Economy, September 2020, pp. 13-14.

56. Dr. George's comparison also disregards the large informal economy in Puerto Rico, the presence of which means that true income levels may materially exceed reported income levels (and much more so than in mainland U.S. jurisdictions).[73] For instance, in a post-PROMESA submission to the United States Senate Committee on Finance, the authors stated:

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[73] *See* Chakraborty Confirmation Report, ¶ 60 ("Moreover, the use of a share of wallet threshold to assess affordability (no matter what threshold is used) assumes that one can determine all of a household's income based on the measurements in reported data, an assumption that is particularly problematic in Puerto Rico where the size of the informal (i.e., unmeasured) economy is often estimated to be over 20% of GNP. This compares to an estimated informal economy in the mainland United States of 8% of GDP. The understatement of true income in reported data implies that even the Board's Hypothetical Residential Customer may be able to afford more than 6% of its measured income.").

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> Puerto Rican official economic data are seriously deficient. The inflation adjusted aggregate data—figures on GNP, GDP, Personal Consumption, etc.—are so poor as to be virtually meaningless. Reliable data on the large informal economy are non-existent. The data problem makes it difficult to gain knowledge of the condition of the economy, undermines the formulation of policy, and creates a degree of uncertainty that inhibits private investment.... Data collection and reporting requirements for Puerto Rico should be the same as for the fifty states…. An additional, but somewhat separate issue concerning data problems in Puerto Rico is the lack of systematic examination of the so-called "informal" sector…. **It is widely assumed that at least 25% of economic activity in Puerto Rico is "off the books" and is not measured by official data**.[74]

57. Thus, estimates of Electricity SOW that are based on reported incomes in Puerto Rico may overstate the proportion of total income (*i.e.*, both reported income and unreported income) that households actually spend on electricity by a far greater degree than is the case in the South Atlantic region (and other regions) of the United States.[75]

58. For these reasons, Dr. George's comparison of Electricity SOW in Puerto Rico to Electricity SOW in the South Atlantic region gives a false impression that the Board's proposed Legacy Charge exceeds an affordable rate, even based on its six percent Electricity SOW threshold.

B. Most Households That Would Pay the Legacy Charge Would Not Approach the Board's Electricity SOW Threshold

59. The corrections to the Board's analysis that I explained and implemented in the

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[74] MacEwan, Arthur, and J. Tomas Hexner, "Establishing Reliable Economic Data for Puerto Rico," *available at* https://www.finance.senate.gov/imo/media/doc/Arthur%20MacEwan%20and%20J.%20Tomas%20 Hexner%20(Submission%201).pdf, pp. 1-2. *See also* Lopez, Luciana, "Desperate for Taxes, Puerto Rico Tries to Get Grip on Underground Economy," *Reuters*, April 9, 2014, *available at* https://www.reuters.com/article/us-usa-puertorico-economy-insight/desperate-for-taxes-puerto-rico-tries-to-get-grip-on-underground-economy-idUSBREA380BS20140409 ("More than a quarter of the island's economy is informal, some studies say, from large companies evading taxes to individuals selling items for cash at roadside stands. But estimates vary widely because the activity can be so hard to track."). There is some evidence (including increased labor force participation rates) to suggest that the size of Puerto Rico's informal economic sector may be diminishing somewhat, but nothing suggests that it has reached levels comparable to mainland U.S. jurisdictions.

[75] *See* Chakraborty Confirmation Report, ¶ 11, fn. 8.

Chakraborty Confirmation Report more than doubled the amount of Additional Net Revenues that PREPA could collect from customers, from $5.68 billion to $13.39 billion.[76] I thus disagree with the Board's advisors, and with Dr. George, that $5.68 billion reflects the outer limit of what PREPA can afford to collect through a Legacy Charge to fund debt service payments to pay its creditors.[77]

60. In response to the George Confirmation Report, it is worth reiterating two points. First, very few residential households with 2024 incomes of less than $24,000 would be required to pay any Legacy Charge.[78] As I discussed above, Dr. George therefore is wrong to suggest that, "as a result of the Legacy Charge," roughly half of households in Puerto Rico would spend more than six percent of their incomes on electricity and thus face a "high energy burden."[79]

61. Second, as I explained in the Chakraborty Confirmation Report, the Board's Hypothetical Residential Customer is not representative of the residential consumers who will actually pay the Legacy Charge.[80] As **Figure 4** below shows, higher-income households would

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76 *See* Chakraborty Confirmation Report, ¶ 23 and Figure 1.

77 *See*, *e.g.*, George Confirmation Report, ¶ 14 ("In my opinion, revenue generated from the Legacy Charge represents the upper bound of cash which can reasonably be made available for debt repayment, given the already high burden on PREPA's ratepayers and PREPA's need to continue operations and modernize its system, among other requirements.").

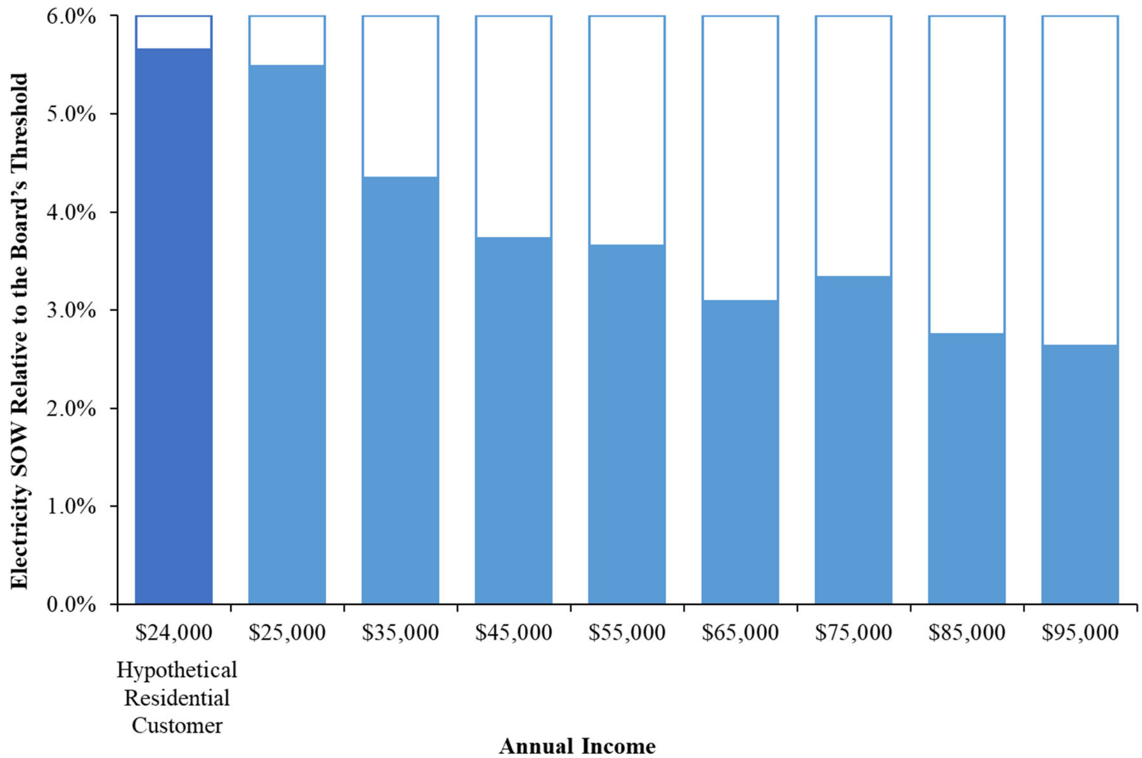
78 *See* Chakraborty Confirmation Report, ¶ 61, fn. 57 ("The approximately 50% of residential customers who earn less than $24,000 per year are largely exempt from paying any Legacy Charge (except for consumption over 500 kWh per month, at half the rate other residential customers would be charged for such consumption). Residential customers in the RH3, LRS, RFR, and GRS 112 (LC Subsidy Eligible) classes are exempt from the Incremental Flat Fee and the Incremental Volumetric Charge for consumption ≤ 500 kWh. These customer classes are assumed to have an Incremental Volumetric Charge (half that of GRS 112 (General) customers) for additional consumption > 500 kWh. See Revenue Envelope and Legacy Charge Derivation Workbook.").

79 George Confirmation Report, ¶ 40 ("… because the SOW calculation is based on median household income, this suggests that around half of households in Puerto Rico would spend more than 6% of their household income on electricity. In other words, about half of Puerto Rico residents would face a 'high energy burden' as a result of the Legacy Charge, further suggesting that the 6% SOW constraint for determining the Legacy Charge represents an upper bound on revenue available to service the New Bonds.").

80 *See* Chakraborty Confirmation Report, ¶ 61.

continue to have Electricity SOWs of materially less than the Board's six percent threshold when paying the Legacy Charge.[81]

Figure 4
Electricity SOW in 2024 Under the Board's Legacy Charge Relative to the Board's Threshold



Source: Chakraborty Confirmation Report, Exhibit 12.

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[81] **Figure 4** charts the same data shown in Exhibit 12 to the Chakraborty Confirmation Report, which uses the PRCS to estimate share of wallet for customer groups starting at the median income level and demonstrates that higher income customers continue to spend a much lower share of income on electricity than the Hypothetical Residential Customer, even taking into consideration the Board's estimation of the maximum rate. *See* Chakraborty Confirmation Report, ¶ 61 and Exhibit 12.

Median monthly consumption in 2021 was extrapolated to 2024 based on the Board's methodology—specifically, the Board extrapolates the 2021 load to 2024 by using the same percent change in the average annual load (adjusted for lighting savings) per customer between the two years. The lighting savings adjusted gross load and the number of customers are taken from the 2022 PREPA Fiscal Plan. Fixed and volumetric base rates and Legacy Charge rates were taken from the Board's Revenue Envelope and Legacy Charge Workbook. Fiscal year electricity rates were taken from the 2022 PREPA Fiscal Plan. *See* Chakraborty Confirmation Report, Exhibit 12.

62. Notably, **Figure 4** is specific to 2024. As such, the figure does not reflect that the Electricity SOW of both the Hypothetical Residential Customer and higher-income households will decline over time due to the effect of income growth as well as the corresponding to the decline in PREPA's anticipated load.

Dated: May 15, 2023

Maureen M. Chakraborty, PhD

Appendix A
Materials Considered

Legal Documents

Disclosure Statement Exhibit P: Legacy Charge Derivation.

Expert Reports

Debtor's Opening Expert Report and Disclosures, April 28, 2023.
Expert Report of David Plastino, May 5, 2023, and associated Exhibits and Backup Materials.
Expert Report of Gary Strumeyer, April 28, 2023, and associated Exhibits and Backup Materials.
Expert Report of Glenn R. George, MBA, PE, PhD, April 28, 2023, and associated Exhibits and Backup Materials.
Expert Report of Maureen M. Chakraborty, PhD, April 28, 2023, and associated Exhibits and Backup Materials.
Expert Report of Sebastian Edwards, April 28, 2023, and associated Exhibits and Backup Materials.
Expert Rebuttal Report of Susan Tierney, PhD., May 15, 2023, and associated Exhibits and Backup Materials.
Expert Report of Susan Tierney, PhD., April 28, 2023, and associated Exhibits and Backup Materials.

Bates-Stamped Documents

"Model – Recovery Analysis PREPA Title III Dismissed.xlsx.xlsx," FOMB_PREPA 00003017.
"PREPA 2022 Fiscal Plan Model.xlsx," FOMB_PREPA 00003018.

Academic Literature

Fisher, Sheehan & Colton, "Home Energy Affordability in New York: The Affordability Gap (2008 – 2010)," Prepared for New York State Energy Research Development Authority, June 2011.

Hernandez, Diana and Daniel Carrion, "Housing Hardship and Energy Insecurity Among Native-Born and Immigrant Low-Income Families with Children in the United States," *Journal of Children and Poverty* , March 2016.

Hernandez, Diana, et al., "Energy Insecurity among families with Children," *National Center for Children in Poverty – Mailman School of Public Health, Columbia University* , January 2014.

Schwartz, Mary and Ellen Wilson, "Who Can Afford to Live in a Home? A Look at Data from the 2006 American Community Survey," *U.S. Census Bureau* , 2006.

Deposition Transcripts

Deposition of William Zarakas, May 4, 2023.
Deposition of David Skeel, May 2, 2023.

Other Publicly Available Sources

Lopez, Luciana, "Desperate for Taxes, Puerto Rico Tries to Get Grip on Underground Economy," *Reuters* , April 9, 2014, available at https://www.reuters.com/article/us-usa-puertorico-economy-insight/desperate-for-taxes-puerto-rico-tries-to-get-grip-on-underground-economy-idUSBREA380BS20140409.

MacEwan, Arthur, and J. Tomas Hexner, "Establishing Reliable Economic Data for Puerto Rico," available at https://www.finance.senate.gov/imo/media/doc/Arthur%20MacEwan%20and%20J.%20Tomas%20Hexner%20(Submission%201).pdf.

U.S. Energy Information Administration, "Puerto Rico Territory Energy Profile," last updated January 19, 2023, https://www.eia.gov/state/print.php?sid=RQ#.